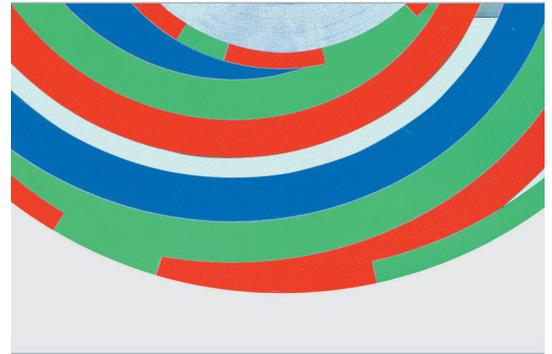




# Coated Optics for Sensor Applications

## Optical Sensor Product Overview

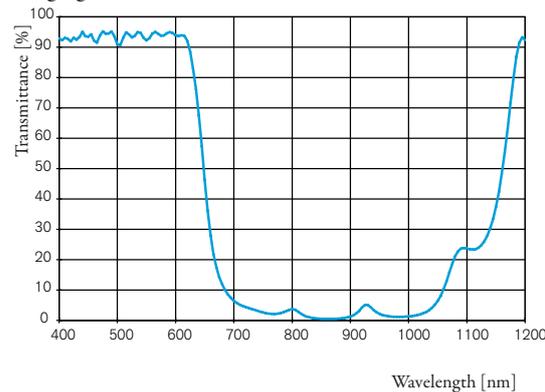
Materion Balzers Optics designs and produces coated optical components for sensor applications. The product range includes filters and mirrors for signal management – selecting and routing optical signals with optimized signal-to-noise ratio. Blocking filters define wavelength windows and prevent sensors from reacting on disturbing radiation. Furthermore, low defect cover glasses are applied for optical packaging to protect and enhance high value added components. Patterning capabilities and a broad range of coating techniques allow for meeting explicit customer needs – of which we are aware that cost effectiveness and environmental stability are of special interest.



## NIR Blocking Filters

Si-based photo-diodes, like CMOS or CCD, are more sensitive on infrared radiation than on visible light. Materion Balzers Optics produces NIR blocking filters, which prevent those sensors from disturbances on infrared radiation and hence enhance contrast in the range of visible light. NIR blocking filters are superior to absorbing glasses because of the excellent transmittance and variable slope at the edge that they offer. Furthermore, the blocking ratio is not dependent on the thickness of the glass, which yields decisive advantages for assembly purposes.

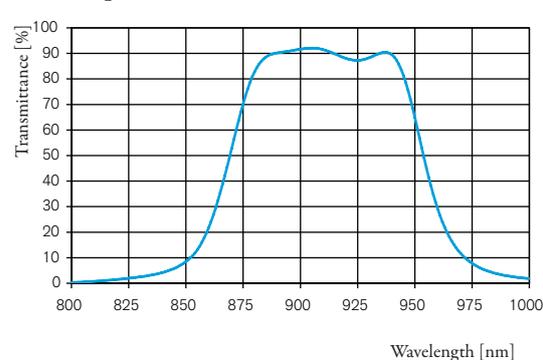
Imaging IRB Filter



## Bandpass Filters VIS and NIR

Bandpass filters select signals and improve signal-to-noise ratios of single-wave photo detectors. Furthermore, large blocking ranges protect the sensor from undesired background radiation. Materion Balzers Optics provides bandpass filters in the range of 400–2500 nm – in a customized manner as central wavelength, half-band-width and blocking range can individually be chosen. Most important, the environmental stability of such filters is enhanced to avoid long term effects such as shifting of the transmitting gap.

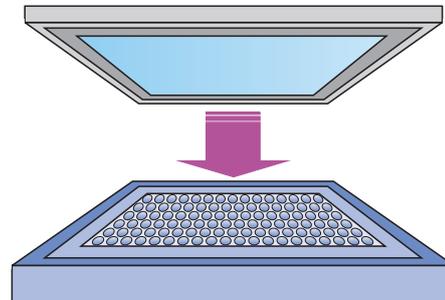
NIR Bandpass Filter



### Sensor Cover-Glasses with Chrome Aperture

The edges of some light sensitive sensors must be protected against radiation of light in order to avoid disturbances or to define the active area of the sensor. Materion Balzers Optics manufactures Chrome apertures on sensor cover glasses for such purposes. These cover glasses can be produced to low defect specifications. The absorption of the Chrome can be chosen in a wide range and the aperture may be coated with different AR types, filters or UV-/NIR-blockers depending on the sensor application.

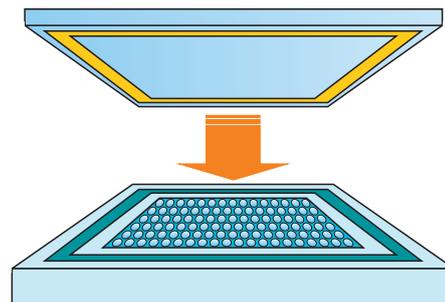
Cover Glass with Chrome Aperture



### Solderable Coating for Hermetic Sealing

Optical sensor devices such as MEMS for example are very sensitive on adverse environmental impacts. Materion Balzers Optics GELOT™ solderable coating allows for sealing glass to metal or ceramics and make hermetical enclosure possible. Patterned GELOT™-frames are an advantage to cover glasses because they combine optical function, aperture and a sealing joint on one single piece of glass.

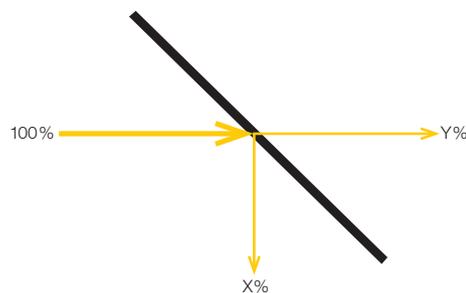
Cover Glass on MEMS



### Neutral Beamsplitter

Coupling out a percentage of a light beam, independent of the wavelength, requires neutral beamsplitters. Materion Balzers Optics provides TRANSFLEX™, a neutral beamsplitter with customized transmittance/reflectance ratios. These beamsplitters are coated with absorption free materials, which avoids intensity loss. TRANSFLEX™ can be provided either as glass sheets or as cemented components.

Function of TRANSFLEX™

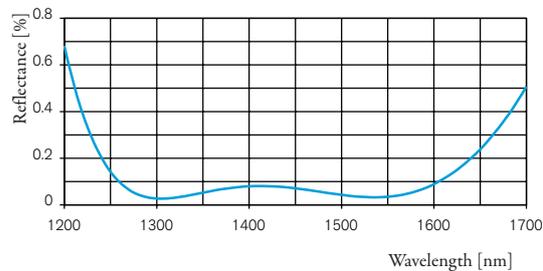




### Anti-Reflection Coating

The transition of light through any optical component is accompanied with reflection on glass surfaces. This can effectively be minimized with an anti reflection coating. Materion Balzers Optics provides a whole range of antireflection coatings. Position and width of the wavelength range with optimized transmittance can be chosen.

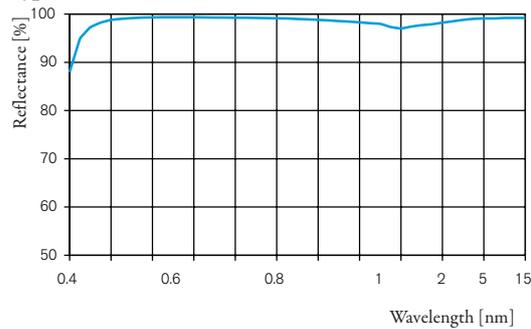
Typical Reflectance Curve of a Broadband NIR AR Coating



### Mirrors

Materion Balzers Optics offers a wide range of dielectric and metallic mirrors. Precise flatness, high reflectivity and remarkable durability of dielectric mirrors make them ideal for applications in the range between UV and IR. Silver coated SILFLEX MK II™ mirrors are multifunctional broadband mirrors, Gold based GOLDFLEX™ mirrors are non polarizing and ultra efficient in the infrared, and aluminum coated CALFLEX™ mirrors finally are broadband mirrors with a high stability and a long lifetime. Advanced coating technologies, like Ion Beam Sputtering allow for the production of ultra high reflective mirrors, which – among others – are applied for laser devices.

Typical Reflectance curve of SILFLEX MKII™



### Dichroic Color Filters

Sensor applications using visible light require highly accurate bandpass, shortpass and longpass filters. Materion Balzers Optics dichroic color filters offer narrow cut-on and cut-off tolerances and further a high degree of freedom of the transmission characteristic for a custom specific definition of the spectrum. The all-dielectric interference filters have almost no absorption and offer maximum long-term, thermal and environmental stability of the cut-on and cut-off wavelengths.

Triple Band Color Filter

